THE AMERICAN ARCHITECT AND BUILDING NEWS.

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WE are sorry to see that our publication of the design of Messrs. Ware and Van Brunt, for the Springer Music Hall in Cincinnati, has misled several newspapers into the belief that these gentlemen had been chosen as the architects for the building. The work was actually given to Messrs. Hannaford and Proctor of Cincinnati (whose design we hope in due time to be allowed to lay before our readers), in a limited competition to which the designs of Messrs. Oakey and Ware and Van Brunt, which we published, as well as that of the successful architects, were submitted by invitation of the committee.

THE shocking accident at Springfield, Mass., on Sept. 29, again illustrates the need of stringent building-laws, and an inspection of buildings. The upper floors of a brick warehouse, loaded with goods beyond their strength, gave way, and fell into the cellar. Some men were buried in the ruins, which immediately took fire; and four of them were killed. We have as yet but little information of how the building was constructed; but it appears to have been one of a block of two that were built half a dozen years ago in a very shabby manner. It is said that, when they were building, the party-wall between the two tumbled down, and was rebuilt. The walls have now outlasted the floors, and are standing. At the time of the accident, forty tons of tobacco were stored on the upper floor, it is said, and forty-two tons of flour in the second story. What was the floor-area over which these loads were distributed, we are not told. It appears that the owners of the building, becoming anxious at the weight which was put upon the floors, consulted the builder, Mr. C. L. Shaw, as to their strength; and it may be inferred that he re-assured them, since nothing was done to strengthen the building; and, if it had stood long enough, another hundred barrels of flour would have been added, we are told, to the load in the second story. It does not appear that any architect was employed in building the block. For more definite information, we must await the result of the coroner's inquest.

LATELY a hundred and forty men were imported from New York to Greenock-on-the-Clyde by Messrs. Coghill & Sons, builders, of Glasgow, to work as journeymen stone-cutters. They were to work at ten pence per hour, and agreed to repay the passage-money, which Messrs. Coghill advanced, in instalments of fifteen or twenty shillings per week. According to the *Architect*, when they reached Scotland, only forty of them went to work. Of the rest, a considerable number turned out not to be stone-cutters at all, and have been dismissed, probably with the same degree of satisfaction with which a tramp is dropped from a railway-train without paying his fare. A score of them disappeared entirely, and the rest are said to be "loafing." Those who have condescended to work now claim payment for the time they were on their passage from New York, which the Messrs. Coghill naturally decline to give; and they resist the deduction from their wages of the stipulated instalments in repayment of their passage-money. At the last accounts, the Americans, who were imported as a resort against the trades-union of the place, had naturally gravitated into it; and, under its direction, had submitted their *ultimatum*, proposing to keep their agreement about repaying their passage-money, and to receive half-pay for the time they were on their passage. To this the employers refused to accede; and it was said that the trades-union, which had interrupted the work before, would now stop it again. The Messrs. Coghill, what with having paid the passage of a hundred men who could not or would not work, and finding it impossible to hold those that would to their agreement, and falling back again at last into the hands of the trades-union, seem to have made an unprofitable speculation.

SIR GILBERT SCOTT, being interested in the project of the town of Newcastle (upon Tyne), has offered a design to the building-committee under circumstances which, being somewhat unusual for an architect in his position, and of some interest in their bearing on professional etiquette, are best indicated in his own letter to the chairman of the committee, which is as follows: —

31 (late 20) SPRING GARDENS, LONDON, S.W.,
April 15, 1876.

My Dear Sir, — In reply to your letter, I beg to say that, in offering to submit a design for the Assize Courts, it is not my intention to cause any expense, unless my design eventually be adopted, or I appointed the architect to the work, in which case I only make the usual charge on the work. At the same time I suppose that, if my order be accepted, it will be with a *bonâ fide* desire on both sides that it may lead to my appointment. My meaning is simply this: I greatly desire to execute this work, but decline to compete for it. Wishing, however, that the council shall not be in a worse position for my preparing a design, in case I do not succeed in meeting their views, I offer to do so on the understanding I have named; viz., that if I fail to satisfy them I withdraw without making a charge. In making this offer, however, I do so in full confidence that they will deal with me as is usual with an architect expressly called in; that is to say, that I shall be enabled to procure all information as to practical experiments, and that if (as is hardly probable that it should) the scheme I first strike out may not be in all points to their minds, I shall receive in full confidence such criticisms as will enable me to revise and correct it. I assume also, that the council will not, after I have submitted a design, lightly and without due reason go to any one else or to competition, but will use their best endeavors to enable me to meet their views, dealing with and encouraging no one else while I am negotiating with them. I remain, my dear sir, very faithfully yours,

GEO. GILBERT SCOTT.

CHARLES HENRY YOUNG, ESQ.

P.S. — I will mention that I am convinced that this method is far more likely to insure a good design than competition.

THE following letter has been enclosed to us, with the request that we should publish it. It is lithographed, which indicates that it was intended for distribution; and it shows one of the annoyances to which honorable architects are exposed, and one of the ways in which dishonorable ones may eke out their commissions.

DEAR SIR, — We will offer you this season, *great inducements* to recommend and apply our weather strips.

If you wish to *buy*, we will make prices *lower* than *any other weather strip* in market; or, if you prefer to *send us the orders* from your customers, we will allow you fifty cents for every window or door you send us. *Cash* as soon as the work is done.

Please call at our office at once; and we will make arrangements with you that will be *satisfactory*. Respectfully yours,

THE PATENT METALLIC WEATHER STRIP CO.

A CORRESPONDENT writes to tell us that, interested by a paragraph in one of our numbers, which described a night-light used by watchmen in Paris, viz., a flask filled with olive-oil in which phosphorus is dissolved, he had tried to get such a mixture put up by druggists in Philadelphia. Two

druggists had peremptorily refused to put it up, saying that the mixture was an exceedingly dangerous one. The way of making the solution described in our paragraph was by pouring boiling oil on a piece of phosphorus; and it is quite possible that this, if done without precaution, might prove dangerous — to the druggist who did it. But when prepared it is harmless. The contrivance is an old one, and was formerly known under the name of the philosopher's lamp. Solutions of phosphorus in ether and *volatile* oils are liable, when spilled, to take fire spontaneously; for the evaporation of the medium leaves the phosphorus so finely divided that it oxidizes very rapidly. The solution in olive-oil, which is not volatile, is innocent, and has been used from time immemorial to frighten children, and amuse grown persons (as has the ethereal solution), by rubbing it on the face and hands, which then become luminous in the dark, or by painting skeletons on the body with it, and the like tricks. It may be prepared without boiling the oil, by cutting the phosphorus into shreds under water, and drying it between blotting-paper, and dropping it into the oil, where it will dissolve slowly.

WE occasionally receive communications which we should print, but that they are anonymous. It is a universal rule with editors, not to publish anonymous communications; and there are very good reasons for it. If an editor takes the responsibility of promulgating a communication, he must in the first place have some guaranty of its good faith, which he can only have by knowing from whom it comes. He must also know to whom to refer if it brings out questions or embarrassments; and, if it touches matters on which he is uninformed, he must be able to judge of the authority of the writer. This applies to all sorts of communications: first, because there must be an invariable rule; second, because the most innocent-sounding paragraph may be a source of trouble if he has nobody to refer it to; third, because the tendency of anonymous writing is *contra bonos mores*. These things are apt to be forgotten by persons who write with very honorable intent. The editor stands between his correspondents and the public. An honorable editor will not betray his correspondent's confidence; but to make his position endurable, as well as to deal fairly with the public, he must know who is behind him. We therefore beg our friends to remember that we cannot use anonymous communications.

THE last received number of the *Architect* in its leader discusses the subject of scientific vanity, or rather professional, with its accustomed shrewdness, and is disposed to discourage the call for architectural diplomas in England. Mr. Godwin contributes a paper on Lintel Architecture, "believing that the architecture of the future, whatever else it may be, must perforce be a linteled and not an arched style." Two interesting articles in this and the preceding number, on the last volume of Mr. Freeman's History of the Norman Conquest in England, consist largely of quotations concerning Saxon and Norman architecture. No Englishman writes on architectural history so suggestively and philosophically as Mr. Freeman; and we recommend our readers not to pass over any of his architectural writing that comes in their way. The other articles are mostly archæological, excepting an extract from the address of Mr. Merrifield at the British Association, on the Sanitary Administration of Towns. The illustrations are two warehouses, one a very plain and vigorous Queen Anne design, and the last of the series of figures by Perugino from Cecchini's engravings. The *Building News* contains an article on Recent Buildings at Brighton; one on Style, which discusses the present tendency in England to return to classical design, and questions the direction of her future development not very hopefully; one on Village Water Supply; and one of Mr. Zerffi's articles on Æsthetical Art Studies, with a variety of smaller matter. The illustrations are the accepted design for the Shakespeare Memorial Theatre at Stratford-on-Avon, — in which, singularly enough, the principal decoration is bestowed on the library (which is very clever), and the theatre looks any thing but theatrical, — a sheet of details of a church at Kensington Park, a dignified and massive school building, a church interior, and a sketch of a ruined manor. The illustrations are curiously uncorroborative of the *Building News's* anticipation of a classical movement. The leading articles in the *Builder* are one on the need of better internal communication in the Indian empire, which opposes the demand for government interference, arguing that a judicious system of canals would be remunerative as a private investment, and ought to be so undertaken; and one on the recent restoration of Chester Cathedral by Sir Gilbert Scott, under the caption, "The New Cathedral at Chester," giving a long and critical account of these restorations. The illustrations are the new reredos in this cathedral, the new front of the "Canterbury," a place of mixed entertainment in London, and a plan of the proposed main exhibition building in Paris for 1878.

ARCHITECTURAL STUDENTS. — III.

THE courses of study laid down for the schools of architecture are the carefully prepared results of long labor and experience. Those who wish to know what is the due preparation for an architect's career will be best informed by examining them. There are, however, some things worth saying for the benefit of those who are obliged to forego the advantages of the schools; as suggestions for the best use of their opportunities, to those who are not; and as possibly helpful to those who wish to decide whether they, or others for whom they are concerned, had best become architects.

We have said — rather ungrammatically — that "the one thing that makes the architect is the instinct and the training of the designer." To include the capable practitioner, we must add the instinct and knowledge of the constructor. Successful achievement requires one of these qualifications as much as the other. The architect, at least, as superior to the mere practitioner, cannot afford to fail in either. The artist in whom the practical instinct is not strong will do best to turn to fine art pure and simple, — to painting or sculpture, or perhaps to decoration merely. It is designers uncontrolled by this instinct who furnish the provocation for such unconsidered and sweeping censure as is implied in Prof. Huxley's recent discourse in Baltimore. How far back in education it is worth while to begin to look out for special training, is a difficult question. Among Americans there is a growing tendency to mark off specialties in education from a very early point, — a tendency so strong that there is danger, we fear, of injury to general culture, and of loss of common understanding and sympathy between different professions. Therefore, while it is well to be on the lookout early for indications of a special bent, and to give it a chance of full development, it is certainly a mischief to abridge the training that has been found best for men in general, because it does not directly favor a chosen specialty. This is a mischief to which architectural students are especially liable; and it is very damaging to the tone of the profession. But the cast of what we may call an architectural mind is so distinctive to those who will look for it, that a good deal may be done before as well as during special training to foster certain faculties that are essential to an architect's success, without interfering with a proper general education.

The constructive bent shows itself early, and is common enough. Men who can recall their own boyhood will not forget how an active-minded boy treasures the plainest toys that can "do something," and despises in comparison the costliest that are only fine to look at: they may perhaps re-

member with a twinge of regretful compassion how often, in the inconsiderate parent's eye, the constructive instinct that made such a boy pull his toys to pieces from an intelligent desire to see how they were made, was confounded with mere destructiveness. It has been a commonplace to call man a tool-using animal: the facility in putting things together, that the boy acquires by early habit in the use of tools, is not to be despised by the man. There is no better foundation for constructive cleverness; and it has the economical advantage of turning recreation to profit, which yet does not, like most profitable amusements, cease to be recreation. It is considered essential in Prussia, we believe, that every boy, even to the sons of the royal family, shall learn some actual handicraft. This, if done thoroughly, must use up a good deal of time which we here would prefer to use otherwise: the rule, however, shows the opinion which is held among a people who, more than any other, have made a serious and systematic study of education.

We have spoken, too, of the importance to an architect of imagination: it is one of his most vitally essential faculties, and too much pains cannot be taken to develop and discipline it. We are not speaking now of a poetic or inventive imagination, desirable as these are, but strictly of clearness of conception, — the power of seeing things distinctly before they exist, and in their absence. Though a faculty in which many people are lacking, it is one of practical importance, and is very susceptible of cultivation. To an architect it is as his right hand. Without it there is no real knowledge of form, or capability of drawing what is not before one's eyes. An architect who does not *see* his conceptions before he sets them down can never design with freedom. Most of us can recall the painful efforts of one or another designer, perhaps a clever and inventive one, but not drilled into entire clearness of conception, to make out in season how his surfaces or details are going to fit into each other; a difficulty which a proper education would have spared him. Memory has much to do with establishing this clearness of conception; and the habit of drawing from memory, on which much stress is laid in the French schools, is an invaluable help to it. No one, in fact, should claim to be able to draw any thing, till he can draw it from memory. How careless people are apt to be in observation and recollection, will be quickly illustrated to any one who will take the trouble to find out in an ordinary company how many persons know the shapes of the letters of the alphabet, say the Roman capitals, of which they read perhaps a thousand or two every day. He will find that not one person in three can show with his pencil — not neatly, for that is a matter of practice, but with simple correctness — which way the letters turn, and which are their thick and which their thin parts. On the other hand, there are probably a great many people of different habit who can testify to their practical dependence on their power of imagination; who, if questioned, for instance, about the appearance of a friend, will call up his image, and see in their mental picture the color of his eyes or the shape of his mouth, facts which they may have forgotten; or who, if they have looked carelessly at their watches, and are presently asked the time, may be able to recall the aspect of them, and read off from the remembered dials the hour which they neglected to note carefully.

Of the helps to clearness of conception, none is more efficient or more essential to an architect than the proper study of geometry. We say the proper study; and here we stumble on one of the unluckiest flaws in our ordinary school instruction. Of all studies, the study of exact form is that in which looseness is most intolerable: yet there is perhaps none in which, even in our schools of highest rank (we do not speak, of course, of technical schools), the instruction is so slovenly as in geometry. A sort of bowing acquaintaince with the stock theorems of plane geometry is all that it is commonly thought worth while to give. It is not enough that the student should be aware of the leading propositions of geometry, the relations of lines and angles, of equal and similar figures, and the like. If these things are to be of much use to him, they must be at home in his mind, as ready and helpful as the scales to a musician, or the rules of percentage to a broker. Yet this sort of familiarity we do not often find, even in the teachers; to most pupils their geometrical studies are something as remote from their ordinary mental condition as their Sunday lessons. A serious shortcoming is the practical limitation of ordinary geometric teaching to plane geometry. Plane geometry without solid geometry is almost as useless as the differential calculus without the integral. It is like piano music for only one hand, or a triangle without a T-square. All the ordinary problems of construction, pretty much all the every-day conceptions of form, are problems and conceptions of solid geometry. The student who stops, as most schoolboys are made to, with a knowledge of the relations of lines and angles in a plane, is condemning himself to stumble among intersections and corners to the end of his days.

We would earnestly advise every architectural student, therefore, to make himself really master of the common solid geometry, — of the relations of planes and angles, the proportions of the ordinary curves and surfaces, the sections and penetrations of the simpler solids; not merely to learn them, but to make them familiar, so that they shall not be laboriously forced into service now and then, to solve an unusual difficulty, but shall be always ready in his mind to form and regulate his conceptions without conscious effort. And this is not a difficult matter. The amount of geometry he will have to learn is not great; he will not be obliged to go beyond the discussion of the simpler curves and solids, nor to follow them into difficult relations. It needs only that he shall be carefully taught, that he shall from the beginning insist on seeing exactly what he is doing and discussing, shall see clearly the relations he is studying, and shall be so familiarized with them by repetition that they shall become part of the ordinary working appliances of his mind.

Of the various forms in which geometry can be set before the student, perhaps none is so directly helpful as descriptive geometry. It is the foundation of all accurate drawing. It is the best means accessible to him of accurately studying forms; its processes ally themselves directly with the whole course of his work, and he must use them constantly in his graphical operations, whether he knows the meaning of them or not. He who has a fair knowledge of it knows perspective *ex-officio*, as it were, — just as one who has mastered freehand drawing can draw mechanically, — and need not trouble himself to learn it. The mysteries of shadows will be clear to him; the intricacies of stone-cutting will not perplex him. Moreover, as a training for the precise and vivid conception of abstract or unseen forms, it is quite unrivalled. The student who masters it will see with thankfulness, every day, the superiority it gives him in quickness and precision of mental sight. This clear-headedness in the matter of form, be it said, since it touches on a thousand subjects of every-day life, is serviceable to other people than architects.

THE ILLUSTRATIONS.

INTERIOR OF THE OLD SOUTH CHURCH AT BOSTON. DRAWN BY L. S. IPSEN, ARCHITECT.

ROOF OF THE OLD SOUTH CHURCH.

[We commend to our readers the article in another column, on the framing of this roof.]

HOUSE FOR J. M. WALKER, ESQ., OAKLAND, CAL. MESSRS. S. C. BUGBEE AND SON, ARCHITECTS.

This house, built last year, is about eighty-six by one hundred and fifteen feet. The exterior finish is plain and substantial.

The first floor gives an entrance hall, fourteen by twenty feet, communicating on the right with the parlor, twenty by thirty-three feet, with large bay window; and on the left with the library, twenty by twenty-four feet, with small bay. The stairway hall is fourteen by forty-seven feet. The sitting-room, twenty by thirty feet, adjoins the reception-room, twenty by twenty-four feet, and the dining-room, twenty by thirty feet. A small conservatory connects with the dining-room, by a window to the floor. In the rear of the parlor is a play-room or nursery, eighteen feet by twenty-four feet six inches, with bath-room and closets, a servant's room, and laundry, each ten by sixteen feet. The second story contains a hall, lighted by a cut-glass skylight over the stairway, four large and five smaller chambers, with large closets for each, a billiard-room, two bath-rooms, a linen-room, two servants' rooms, and rear hall with stairs to the attic. Several well-lighted rooms are finished in the attic-story. The dining-room, main stairway, and bath-rooms are finished in black walnut. The principal doors on both floors are of walnut. The library is finished in mahogany; the nursery, kitchen, and laundry in white cedar and redwood; and most of the other finish is of white cedar and painted. The main halls and principal rooms on both floors are handsomely painted. A wide piazza extends from the main entrance on the north side around to the carriage entrance on the east side; and there is also a piazza around the octagon projection on the south side. The house cost about fifty thousand dollars.

RESIDENCE ON DREXEL AVENUE, CHICAGO. MESSRS. BURNHAM AND ROOT, ARCHITECTS.

This house is to be built of point-hammered limestone, with arches and bands of dressed sandstone. All the outside woodwork is to be left of the natural color, and finished with oil.

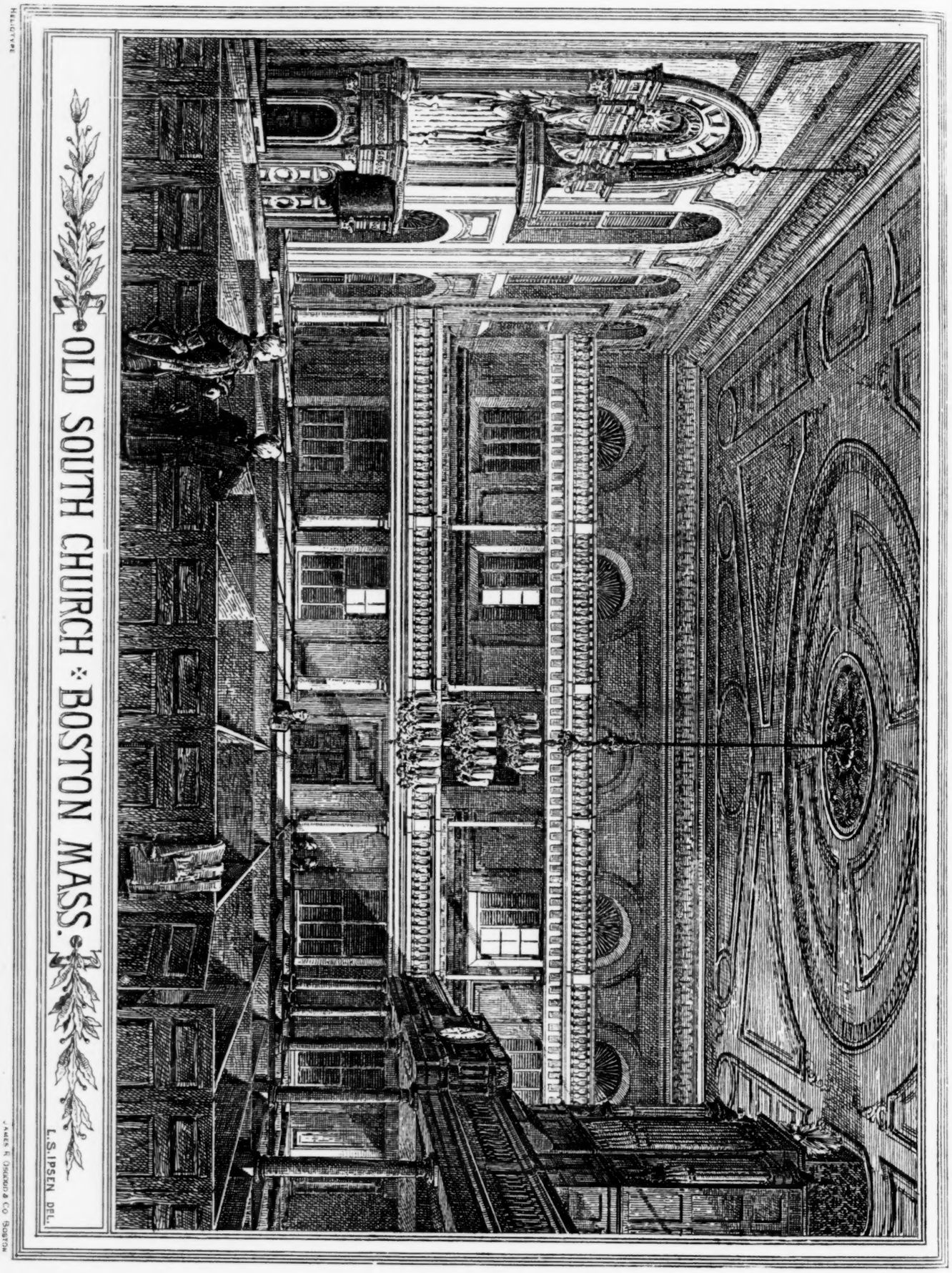
CERAMICS AT PHILADELPHIA. — IX.

THE introduction of open-work into the manufacture of earthenware, china, and porcelain, is by no means a novel, at the same time that it is not a very old form of decoration. Neither the Chinese nor the Japanese potters seem to have availed themselves of the facilities a resort to it gives for enhancing and varying the richness of their pieces; but the added beauty of pierced borders and edges upon fine china, especially where the centre bears some design in colors, and gold is applied in fine lines and upon the open-work, cannot fail to attract the keen perception of the Japanese in the present exhibition. The French scarcely touch this form of art, and the Germans altogether avoid it. The Italians have meddled with only to mar it. Cesare Miliani of Fabriano shows among his pieces of *terraglie* a batch of card-plates, each single-colored; but the form is precisely that which would result from the placing of strips of maccaroni regularly side by side and across, and then cutting off the ends, and edging with a strip around the whole; and the colors are garish and not pleasing. In the British section, A. B. Daniell & Son (for Mintons); Brown-Westhead, Moore, & Co., of Hanley; Bates, Walker, & Co., of Burslem; and William Brownfield & Son of Cobridge, — have made open-work one of their specialties, and have achieved meritorious success. The china thus treated by Mintons is of the finest, and the decoration is marked by great good taste. Brown-Westheads have committed, however, one mistake that would not be apparent to ordinary eyes. They display cups and saucers of the zephyr pattern; the cups with perforated feet, and the saucers with perforated edges. These are, doubtless, intended never to be used, but to be placed behind glass doors in a china-closet, or upon a sideboard, where care will be uniformly bestowed upon the dusting of the various pieces of rare and curious workmanship. But even an object of art, if it be moulded in the shape and similitude of something for daily use in the service of the household, should in the details of its decoration be, at least, not inconsistent with the *idea* of use. Plates may, without any disregard for æsthetic principles in the abstract, be well treated in this manner; and here the Hanley firm deserve the highest praise. A dessert plate which has no fewer than five hundred and sixty perforations, the centre bearing painted flowers, fruit, birds, and faces, and gold being also employed, is a triumph of chaste and effective art. We were curious to learn the value of such a piece, and found it priced at thirty dollars. The Brownfields exhibit some new designs treated in the same fashion. Vases of a square shape, with flat sides and perforated projecting fringe upon the edges of the four angles, are perfect examples of the Japanese style. Each side in turn bears a different subject; and Jahn has availed himself to the full of the liberty given him by this peculiar shape for bold, varied, and always effective painting, in some instances beneath, and in others above, the glaze. Still another novel feature is observable only in the fine china of Maurice Fischer's sons, exhibited in the Austro-Hungarian section. This is the formation of a double body, the outer one alone being perforated and painted, for teapots, &c., in the Chinese style. The outer body is made separately; the interstices (which are capable of unlimited variation at the discretion of the artisan) are cut out with the pointed edge of a tool, and while both bodies are yet plastic they are joined together at the edges; the firing combining them firmly, without revealing a joint. The method thus initiated might be employed with marvellously rich and beautiful effects in the production of large vases of china; and possibly also its application to lamps and shades of transparent porcelain would be deemed not inconsistent with utility.

Another form of decoration unknown to the Chinese is to be seen in the stall of the Brownhills Pottery Company. This firm is among the most youthful in Great Britain, dating its commencement no farther back than four or five years ago. No special effort was put forth in anticipation of the Centennial Exposition; and the wares that are shown are merely such as are daily produced for the home market in England. The company has no reason, nevertheless, for the avoidance of competition; and its manufactures are worthy of it. Prominent in the display at Philadelphia are a pair of flower-brackets, perfectly transparent, with flowers in relief projecting fully an inch and a half to two inches, colored in the gorgeous hues of the choicest productions of the conservatory. The pieces are marvellously well executed; and, of their kind, they stand alone in the vast building at Fairmount Park.

We have already had occasion to notice in terms of commendation (in the fourth article of this series) the turquoise ware made in New York. This, however, is surpassed by one of the Japanese and one of the British exhibits; Fukihara and Mintons having run, so to speak, directly in competition, save in their designs, in the decoration of vases with cloisonné enamel. The original work of this order, produced in past years by the Chinese and Japanese exclusively, until Barbedienne of Paris engaged in the manufacture, was made in a manner quite different from that now pursued. A copper vessel of the required shape would first have traced upon its exterior surface the lines of the pattern; fine flattened wire would then be soldered by an edge to the lines, so as to form cloisons, which in their turn would be filled with a composition, and that again colored with metallic oxides; the piece would then be vitrified by heat, and the surface polished or burnished by rubbing. The Japanese now, like Mintons, substitute a porcelain for a metallic body, and paint on it with opaque enamels. Both, in fine turquoise blue, show the evenly deep and rich color with wonderful brilliance. The "Prometheus" vase in Daniell's stall is, perhaps, the most transcendent in beauty of all the specimens hitherto seen. Made entirely of china, nearly four feet in height, and remarkable for the softness of its glaze, the design which it bears is not likely, once seen, to be speedily forgotten. On the cover, Prometheus is assailed by the vultures. The group is modelled with great force and power. The handles of the vase also are admirable examples of the possibilities of artistic treatment, being perfect imitations of metal-work, and joined to the vase by allegorical figures incased in suits of mail imitating gold and silver. The solitary fault which may be found with the piece is the anachronism of chain and plate armor in any association with Prometheus. The objection loses much of its potency, however, when it is remembered that the episode which is represented is mythological, leaving a wider latitude for the filling-in of accessory details than an historical subject permits; and, further, that the myth supposes Prometheus to be chained to the rock with birds of prey feeding upon his vitals to all eternity.

The porcelain of Spain is not remarkable for its excellence. Pickman & Co. of Sevilla exhibit nothing that is calculated to humor any but a vulgar taste. The decoration is not harmonious, nor is there either strength or richness of gilding and color. It is more noteworthy, however, except as to shapes, than the Caguela, and the coarse glazed, cane-colored, and crude earthenware of Juan Olago, which the Pennsylvania Museum has purchased in bulk, — possibly for, in some instances, the novelty of the shapes, and in others for reasons that are incomprehensible to connoisseurs and indifferent observers. In this association may be named a prominent feature in the exhibit of La Cartuza of Sevilla, that might form the subject of experiment with better taste elsewhere, — a wash-basin that is shell-shaped, raised at the back (where the second shell would adhere) to form the soap-dish. In this a pink

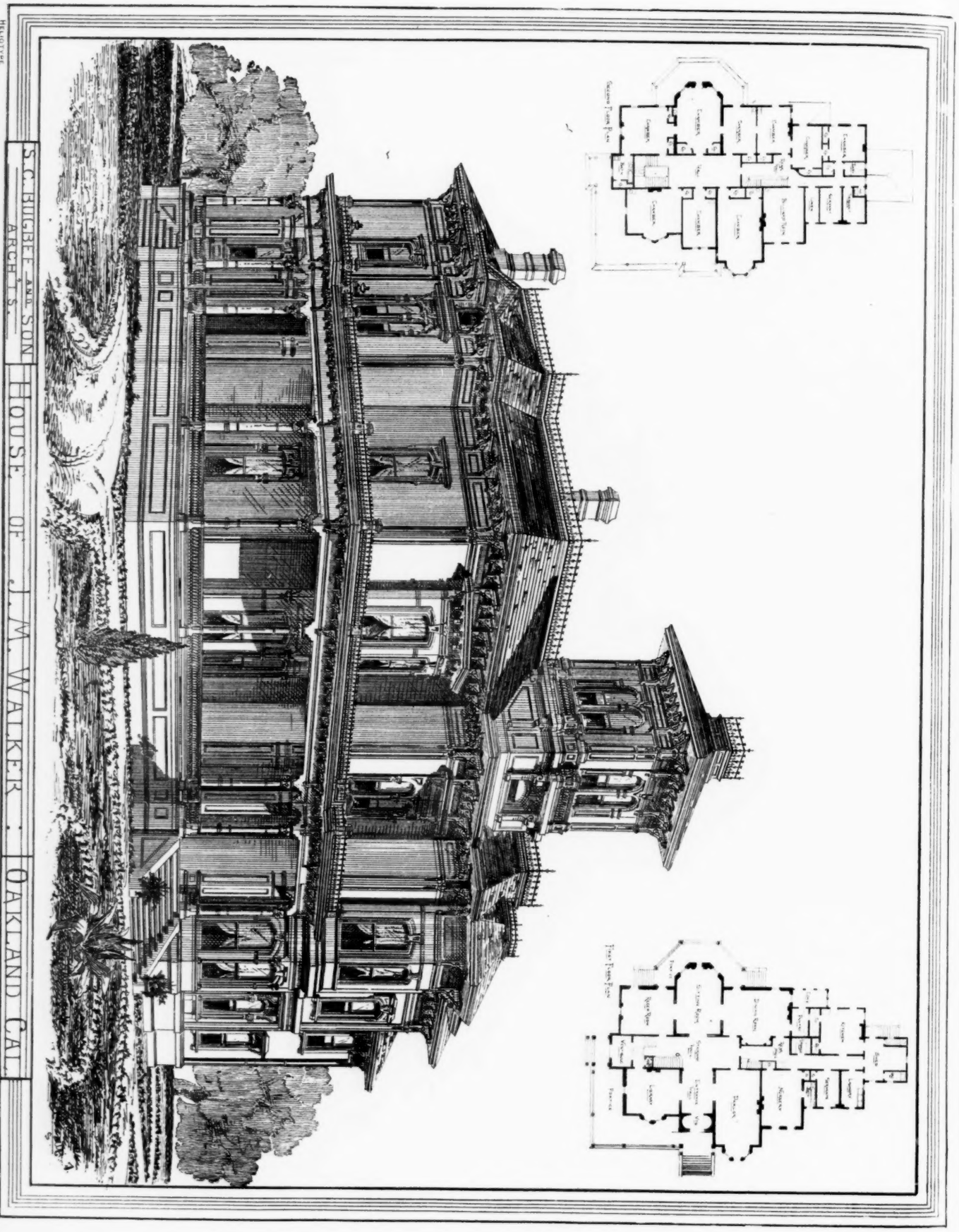


OLD SOUTH CHURCH · BOSTON MASS.

L.S. IPSEN DEL.

HELIOTYPE

JAMES R. OSGOOD & CO. BOSTON

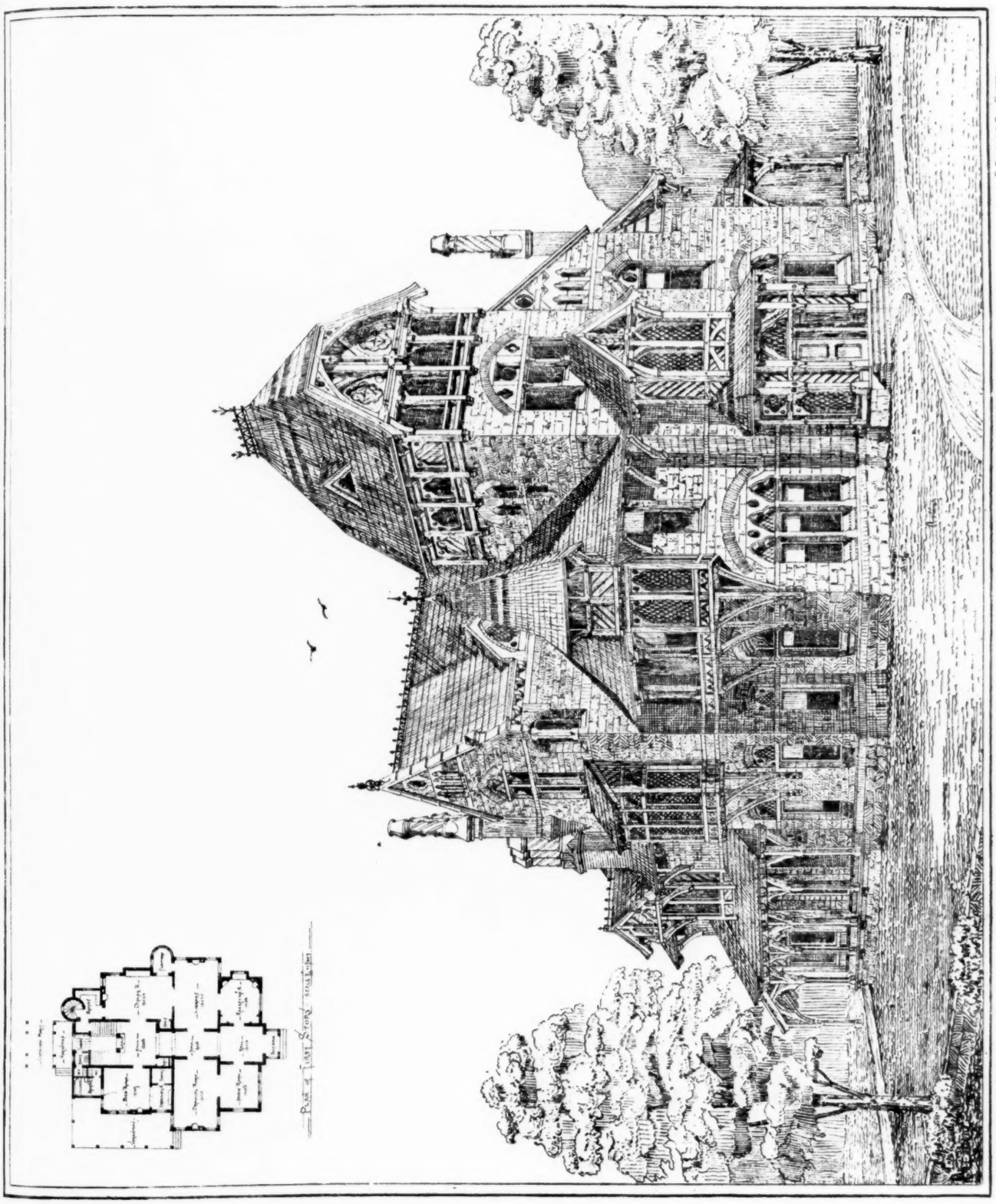


S.C. HUGHES AND SON
ARCH'TS.

HOUSE OF J. M. WALKER. OAKLAND CAL.

HELIOTYPE

JAMES R. OSGOOD & CO. BOSTON

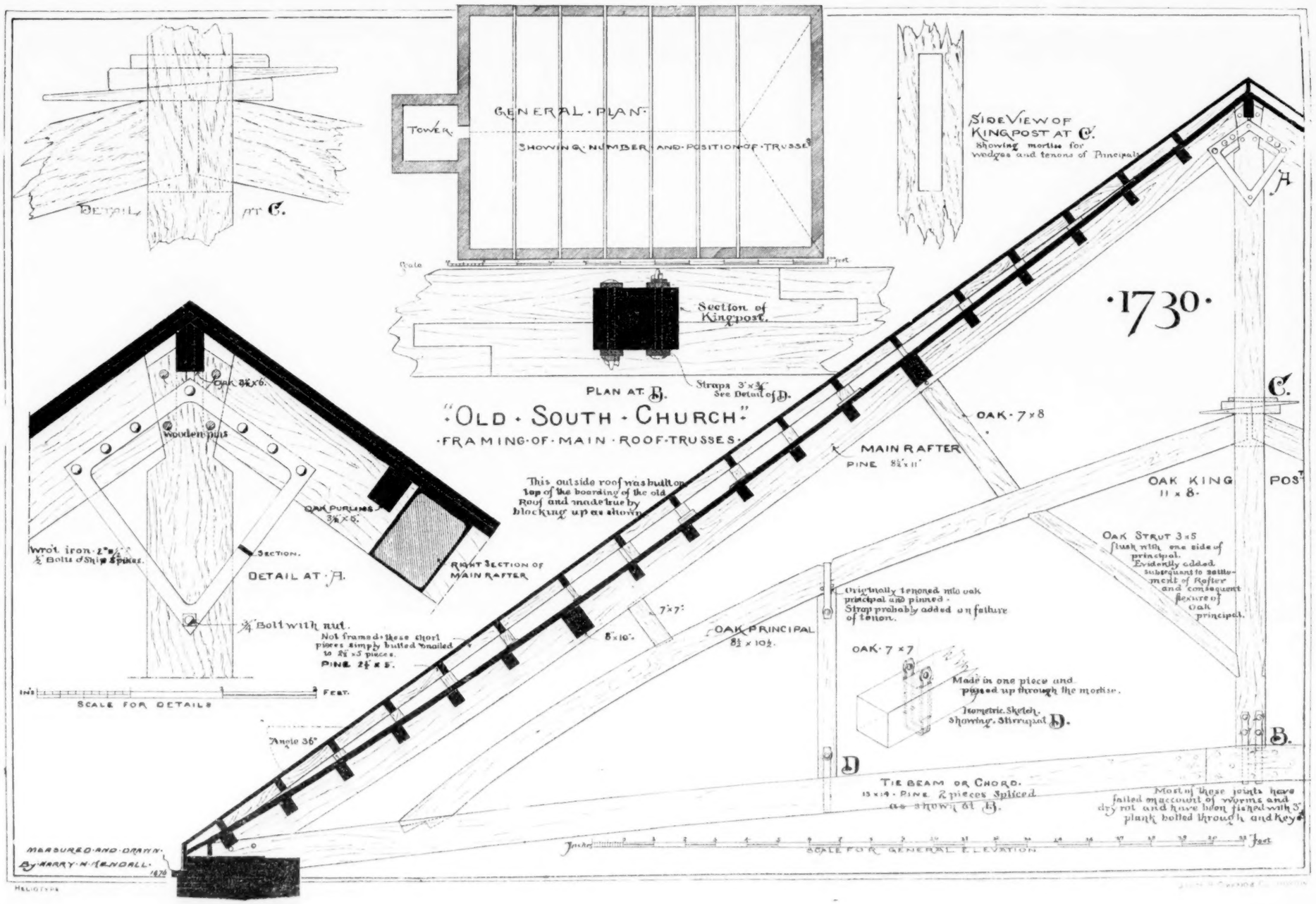


DESIGN FOR HOUSE IN DREXEL BOULEVARD CHICAGO

BURNHAM & ROOT ARCHTS

JAMES R. OSGOOD & CO. BOSTON

PLAN OF FIRST STORY


GENERAL PLAN
SHOWING NUMBER AND POSITION OF TRUSSES
TOWER
Scale
Section of King-post.
PLAN AT B.
Straps 3"x¾" See Detail of D.
SIDE VIEW OF KING POST AT C.
showing mortise for wedges and tenons of Principals
DETAIL AT C.
"OLD SOUTH CHURCH"
FRAMING OF MAIN ROOF TRUSSES
·1730·
OAK 7x8
MAIN RAFTER
PINE 8½x11"
OAK KING POST
11 x 8.
OAK STRUT 3x5
flush with one side of principal.
Evidently added subsequent to settlement of Rafter and consequent flexure of Oak principal.
This outside roof was built on top of the boarding of the old Roof and made true by blocking up as shown
OAK PRINCIPAL
8½ x 10½
7x7"
8x10"
Originally tenoned into oak principal and pinned. Strap probably added on failure of tenon.
OAK 7 x 7
Made in one piece and passed up through the mortise.
Isometric Sketch showing Stirrup at D.
TIE BEAM OR CHORD.
13x14 PINE 2 pieces Spliced as shown at B.
Mortises these joints have failed on account of worms and dry rot and have been fished with 3" plank bolted through and Keyed
Angle 36°
OAK 3½x6.
Wooden pins
OAK PURLINS 3½x6.
Wrot iron 2"x¾" ½ Bolts & Ship Spikes.
Section.
DETAIL AT A.
RIGHT SECTION OF MAIN RAFTER
¾ Bolt with nut.
Not framed these short pieces simply butted & nailed to 8½ x 5 pieces.
PINE 2½ x 5.
Ins
Feet.
SCALE FOR DETAILS
Inches
Feet
SCALE FOR GENERAL ELEVATION
MEASURED AND DRAWN By HARRY N. MENDALL 1876
HELIOTYPE

color is fused, or shot with gold; but the tint is altogether indeterminate, and fails to charm.

Some painted china is shown from the Fabrique de Porcelaines in the Maison de Vente, Paris; an ample variety, in English, Persian, and Chinese styles, by A. B. Daniell & Son of London; china, painted plaques in frames, porcelain bearing decoration with enamel colors, and porcelain treated as maiolica, by Powell & Bishop of Hanley; china and opaque porcelain, with effective designs, by Bates, Walker, & Co., of Burslem; vases of Persian blue with flowers sparsely and tastefully painted in green, red, and yellow, and with a fair use of gold, by Isaac Davis of Trenton; some skilfully decorated jugs, — one with rustic foot, grapes and vine-leaves; another, barrel pattern, with leaves and barley-ears; others, with white decoration upon a chocolate ground; others again, with metallic self closing and opening lids, acting upon swivels, which are somewhat novel even in England, — and several choicely painted dinner-services (one of one hundred and nine pieces bearing on each a distinct subject), fruit-baskets, &c., by Brown-Westheads of Hanley; some small services and ornamental pieces, possessing genuine merits, by M. Marmaka in the Japanese section; and a number of specialties in patterns, decorations, and designs, by Brownfields and the Brownhills Company of Cobridge and Tunstall respectively.

The peculiar strength of William Brownfield & Son is due, in a measure, to the cultivated taste of their art director, Jahn, who was in the employ of the Mintons when the French International Exposition was held in 1867 at Paris; and to the high character of the paintings on and with enamels, executed by Carrier, Cartledge, Hartshorn, Pienne, Protat, Rouse, and Sander. Chinese, Egyptian, Japanese, and Louis XV. styles, are interspersed with realizations of homely incidents, as in the kitten vase, and an adaptation of the theme to celadon centre-pieces. Of these last-named productions, several examples are shown, representing a cat playing with a ball. One-half the ball forms a cup that may be used for fruits, or, with the perforated lid, it can be converted into a bouquet-holder. The *pièce de resistance* of the Brownhills Company is the Hindoo vase, two feet in height. The body is globular, a tall neck tapering gracefully from it; the cover being surmounted by a spiral knob, solidly decorated with gold, which is also used in rings upon the sides. Various styles of decoration are adopted; but the model was the work of William Clews. A smaller Greek vase, in shape between the Italo-Greek and the Amphora, bears effective paintings of English flowers by G. Evans, in natural colors. The Derby scent-vase, Oriental in character, four sided, is most appropriately decorated in the Persian style; but is also enriched with panel-subjects by Hancock, representing Scotch and English landscapes. The Chinese vase presents the pleasing contrast of pencilled Chinese tracery on Persian blue with soft yellow bands.

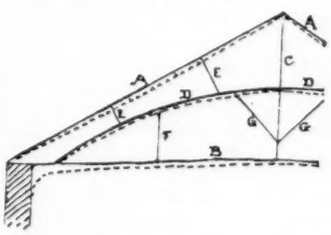
The porcelain manufactures of Sweden, we reserve till the last, because of the massive character and large proportions which, for the most part, they display. The Rörstrand Company of Stockholm gained medals at Paris and Vienna, and the size and excellence of the exhibits attracted no little attention from English potters; nevertheless, that so excellent a display should now be made, is a cause for surprise at Philadelphia. The potteries of Sweden have lain under the double disadvantage of drawing their supplies, both of raw materials and of fuel, in great part from Great Britain. On the other hand, the popularity of porcelain fire-stoves, which give out instead of, like the iron-work of America and England, absorbing heat, has furnished a constant stimulus, and has led to the production of pieces of great size, since, of necessity, the stove or mantle is best which contains the least number of separately made parts. A mantle and pair of candelabra which have been purchased by Mrs. Astor of New York, for twenty-two hundred dollars, are striking objects. The mantle is twelve feet in height by five feet in breadth, uniformly even in color, and modelled and decorated in the style of the Renaissance. The pilasters are surmounted by capitals of the Ionic order, and the piece bears geometric and copies of natural forms in relief; scrols, ovals, circles, squares, and diamonds, crosses, flowers, fruit, and figures, being so distributed as to give variety without overloading to the decorative effects. Another piece, that is especially worthy of a note, is a close stove of square shape, from which as from a pedestal springs a perpendicular rounded columnar shaft fairly proportioned, upon which is superposed an eagle with outstretched wings, the pinions and head of which are tipped with gold as though by the gorgeous rays of a brilliant sun in whose light the majestic bird freely basks. The lower part of the column is encircled by a band of color upon which a geometric pattern is traced. The upper part is adorned with floriated and scroll patterns, with groups in the midst of them. The stove at the foot inclines to buff color; the decoration is variously gold, green, and buff, in keeping with the base-color; and panels beside the stove-door are enriched with flowers. The details of each of these great pieces are boldly conceived and executed. There are, however, infinite possibilities of variation in style and design, not a few of which the other exhibits at Philadelphia will in all likelihood have suggested to the heads of the Rörstrand and Gustafsberg factories.

"OLD SOUTH" ROOF.

As an example of American carpentry of one hundred and fifty years ago, the roof of the "Old South" in Boston merits a passing notice. Having had recent occasion to examine the building, the accompanying drawing of the roof was made; and as a matter of record, as being a curious example of early colonial work which would be generally interesting, and as an example to others to detail any quaint bit of work falling within their observation, I herewith submit a few facts in regard to it.

The roof of the building (which is some 65 x 95) is supported by six trusses spaced at about equal distances from each other, but the last truss somewhat farther from the rear wall, in order to avoid too steep a pitch from it to that wall. The workmanship is quite primitive and rude, most of the timber being hewn sticks; and the sapwood at the angles is in many instances affected by dry-rot, or, in common parlance, is "powder-posted."

The trusses are much sprung and distorted, both horizontally and laterally — variously in different trusses; but, from a consideration of some defects common to them all, their story may be guessed with a considerable degree of accuracy. The execution of the roof indicates ship-builders' work; and, in the days when the division of labor had not reached its present development, it is more than probable that men who had served their seven years in the yards of the "Old Country" had a hand in the work. The first step in the construction, which occurred to the builders, was evidently a pair of rafters A A, a tie-beam B, and a kingpost C, to support the centre of the tie-beam at its point of splicing.



The tie-beam, by the way, is cambered about two and a half feet, nearly following the line of the plastered ceiling hung to it below. Had the tie-beam and ceiling been built level in the first instance, they would evidently have later shared the misfortunes of the principals, and have now been convex instead of concave. Having proceeded thus far in the design for their roof, they next bethought them that the rafters A A, some forty feet in length, without intermediate support, would not be sufficiently stiff to carry the roofing. Now, instead of proceeding to erect struts from the foot of the kingpost C, to the principals A A, at about right angles to the latter, and from their points of contact to drop tension-pieces to the tie-beam, and from their feet to erect other struts similar to the first, — thus forming a perfectly rigid frame, and obtaining intermediate points of support for each rafter, — they let loose the incipient Yankee ingenuity which the east winds were even then infusing into their minds, and, following the bent of a shipbuilder's mind, took another course.

They procured stout hewn oak beams, D D, and by some means best known to themselves — either by the coaxing of steaming, or the coercion of pulleys and tackle — formed of them arches; their feet stepped into the tie-beam near the walls, and the other ends keyed in position by wedges passed through a mortise in the kingpost. Now they had constructed, within their truss, a sort of bowstring girder, upon which they founded their hopes of supporting the principals A A by means of the blocking, or struts, E E.

Having added the suspension pieces F F, they rested from their labors, and rejoiced in their work. Their future fame, however, was not secure; for the shrinkage of the timber, probably aided and abetted by some "old-fashioned New England snow-storms" of which we hear so much, caused the roof gradually to assume the form indicated by the dotted lines; and the natural remedy against further misplacement in that direction was the introduction of the small oak struts G G, about 3 x 5, which are merely

notched in their thickness (3″) from one side of kingpost and arched beams; showing clearly an after-thought, especially as they do not coincide in size with any of the other timber, and are not tenoned nor pinned. Then the tenons of some of the suspension pieces F broke off short; and stirrup-irons were added to make them secure.

The old roof was double-boarded, and so remains to-day; but at some comparatively recent period, to correct its extremely crooked condition, a new roofing was superposed upon the old, blocked up so as to make the surface true, and slated, the old covering, whether shingles or slates, being previously removed.

The iron-work is all very primitive in design and make, and speaks eloquently of the "village blacksmith," when his forge was perhaps on Park Street.

Such is something of the yarn the old roof spins; and, if the civil engineer was in those colonial days "abroad," the schoolmaster was undoubtedly in his company, as some of the appended inscriptions chalked on the old rafters would indicate: —

Homer
April 6, 1774.

1762 February 9
A New Rope for the Bell
19 pound and a half.

A Nother Bell Rope
october 12, 1767.

A Nother Bell Rope
August the 1, 1770.
It wad 20 pound and a half.

Thos. Bruce, Repeared the Sleating
May the 1st 1809.

Edward Russell gilded
the Fane Ball & Diols
Feb. 1828.

W. G. Preston.

PROF. HUXLEY'S ADDRESS.

The *Tribune's* report of Prof. Huxley's address at Baltimore makes him say that he "has seen great educational funds fossilized into mere bricks and mortar, just as if architecture is a kind of petrifying stream," and advise the trustees of the Johns Hopkins University not to "think of building by any hands higher than those of a bricklayer, who will do for them exactly as they want, and nothing else." The professor is reported to have added, speaking of the appliances of a thoroughly organized university, and still addressing himself to the trustees, that "when there is nothing more you want or would want, then, if there are a few hundred thousand dollars left, send for an architect, and let him put a façade on it. If you do any thing else, you will get a building which will contribute very much to his fame, but not to your need."

The previous remarks of Prof. Huxley on the same occasion, as to the primary educational foundation necessary for the proper development of a man of ability into "a great writer or speaker, statesman, lawyer, man of science, painter, sculptor, architect, or musician," and as to the vital importance to the welfare of a community that "those who are stirred by the divine impulse of intellectual thirst or artistic genius should be enabled to devote themselves to the higher service of their kind, as centres of intelligence, interpreters of nature, or creators of new forms of beauty," are so entirely in consonance with what is known of this most eminent man, and leave so little to be desired in the way of recognition and appreciation by any artist (architect or other), that it may appear not only presumptuous but ungrateful in one to criticise his first quoted expressions. Indeed, the professor's magnanimity, and his thorough emancipation from professional narrowness and conceit, challenge the complete respect of the artist. His admission farther on, that the artistic or creative faculty is rarer than the power of scientific investigation (which latter, at all events, demands more drudgery and faithfulness), is very admirable, coming from one who stands at the apex among those whose world-wide reputation has been made by gathering and interpreting the facts of nature.

Yet I venture, in the interest of my specialty (architecture), and, beyond that, of the community which that specialty, if rightly invoked and administered, most beneficently serves, to call attention to points made by the professor, which I believe to have been considered on insufficient data, and to be unintentionally unjust. I think every liberally trained architect who is not a mere provincialist by nature will agree with him that it is an outrage to a community to convert funds required for the maintenance of the best attainable collegiate faculty, and the best attainable educational appliances, into brick and mortar, which are of course worthless, — the mere shell without the kernel, — unless that which they are to shelter is first and amply provided for. But it seems to me that it is undoubtedly and primarily the place of the trustees of a corporation, while it is not necessarily that of their architect, to co-ordinate the means placed at their disposal with the needs to be provided for, as it is also for them to proportion the details of each. The building-committee to whom they generally depute part of their powers will indeed, if they have shown sagacity in their selection of an architect, and if they work in harmony toward their object, take him very thoroughly into their confidence as to both needs and means. But very often the members of a building-committee do not work in harmony. Very often they are captivated by ornament, or by vastness of dimensions, and reject the design of a plain façade, coupled with a well-considered scheme for an interior, in favor of a meretricious exterior attached to an elaborate and costly but poor plan for internal arrangement. Sometimes each member has his own love of personal influence and power to serve; and these are for current purposes, which is as far as most men get, served much better by a building which will be in everybody's mouth than by one too quiet to excite much remark. I think many experienced architects have known instances of their suggestions toward simplicity and economy being highly resented by building-committees. It may be, as the professor insinuates, that instances occur in effete monarchies like England, of aristocratic trustees and bloated building-committees weak-mindedly allowing themselves to be trampled under foot of haughty architects in the interest of their classic, Gothic, Renaissance, Queen Anne, or Victorian renderings and contingent fame; but, alas! in this new and commercial democracy, the professor's well-meant and public-spirited note of warning must be candidly pronounced quite supererogatory.

Then, as to that bricklayer, the professor may consent to be reminded that even the best-grounded and best-rounded philosopher in the world — for even such a one cannot sustain every link in all the chains that make up the world's specialties — is apt to give bad or incommensurate advice if he too hastily, under the impulse of some passing enthusiasm, applies the results of abstract generalization to concrete exigencies. This reference and the remark afterwards quoted, about sending for an architect to put on the façade to the result of the trustees' brain-work and bricklayer's handiwork, entirely ignore the fact, which has obviously not come within the professor's knowledge or consideration (for it is the religion of a scientist not to ignore facts), that the façade is but a small part of the scheme of a building; that the interior arrangement is really the thing to be considered, the exterior growing out of and fitting on to the interior. The façade is only the skin that covers the muscles and nerves, the skeleton and viscera; yet it cannot be tacked up like a curtain, as they have discovered in Florence after five or six hundred years' endeavor to supply one to the Duomo there; and it is by no means certain that every human being, however well-conditioned his or her subcuticular arrangements may be, would not vastly prefer a beautiful skin, well fitted to the carcass, to a rough, baggy integument, if his or her option had any thing to do with the matter. Does Prof. Huxley think he could fit the cuticle of an animal of one species to the carcass of one of another species, or even transfer the cuticles of two individuals of the same species, with comfortable or satisfactory effect either to the wretched creature itself or to the unhappy spectator? Yet such an attempt would be exactly tantamount to the advice he gives the confiding trustees. By the way, I am glad to notice the professor's liberality in financial respects, as far as relating to façades, and should be delighted to see him preside as chairman on many façade-building committees, if such there must be. For the mere ashlaring (as it is technically called) which I understand him to propose in his ideal scheme of building-operations, his appropriation of the "few hundred thousand dollars left" — say half a million — is very handsome indeed. If the professor had known or reflected that an architect is, or should be, not only an artist in the æsthetical sense of the term, but a fiduciary agent, and one versed in the science of statics and in the apportionment of spaces and appliances for public and domestic purposes, he would have realized the practical insufficiency of the remarks I have felt it my duty to question.

One thing it would be safe to promise Prof. Huxley, if his

scheme for realizing his *beau ideal* of a university were put in practice. He would undoubtedly get "nothing else" than laid bricks from the bricklayer; whether well laid or not, would depend on the quality of his mortar, and the pay he should give his journeymen. But it would by no means be safe to say that the trustees would themselves know "exactly," or even in the loosest way, what they might want in the matter of spaces and solids, of stone, brick, iron, wood, or plaster; or that, after the bricklayer's bills were paid, they would recognize the result as tantamount to their scheme. On the contrary, it is entirely safe to say that they would do neither the one nor the other.

If Prof. Huxley were an ordinary teacher, whose words would be left behind the lecture-room door by average hearers, there would be no need to notice the implied aspersions on a whole profession covered by his observations. But his address has been or will be read everywhere by cultivated people, on whom the profession largely depends for subsistence. And it seems to me not unreasonable — and I think Prof. Huxley will be the first to allow this — that one of that profession should be allowed to parry the blow that his influential utterance is liable to inflict on it. *Sus Minervam.* A. J. BLOOR.

NEW YORK, Sept. 16, 1876.

THREE GOOD HOUSES.

SEVERAL years ago the writer of this article had occasion to find a new domicile in one of the favorite suburban resorts of New York city people, and finally settled upon a large cottage in a very healthy town. This cottage was better ventilated than even wooden houses are likely to be; but as pure air always seemed cheap to the writer, even though an extra large coal-bill was incurred, the cottage seemed particularly desirable by reason of the fault alluded to. When winter arrived, however, not even loosely framed doors and rattling windows admitted enough pure air to keep the occupants awake and bright through the short evenings of a family which always retired early. The writer occasionally imagined that he detected an unpleasant odor at the register; and some friends to whom he mentioned his supposition suggested dead mice in the pipes which conveyed heat from the furnace to the registers; others suggested that a cast-iron furnace was at the bottom of the trouble; still others (who were promptly withered by a glance from the writer's better half) suggested a dirty cellar. The writer finally learned that the cellar was occasionally damp; and he noticed that its floor sloped very gradually toward the centre. Putting both facts together, he was not surprised to find a drain *directly under the furnace*, to carry off water; this drain led to the cesspool; and when the furnace was in operation the foul gases of the pool were sucked up by the furnace, and conveyed through the house. This house stood on a good street, was built for occupants with purses of reasonable length, and passed as one of the best houses that could be hired in the village.

Moving from this house to another which had long seemed attractive, the writer soon found that unless his cellar windows were always open, and a good draft passing through them, a bad smell would find its way into and through the house. An examination of the cellar showed that this receptacle was generally very damp; though why it should be was not apparent, for a drain started from one corner, and ran to a brook not far away, and at a respectable descent. It was finally discovered, however, that the water in the well (which was near and in front of the house) was often above the line of the bottom of the cellar, and that, although the house stood at the foot of a valley, it had no exterior or bottom protection in the shape of drains. It was simply impossible to keep the carpets, bedding, walls, etc., of this house, from feeling damp, even when a steady fire burned in the furnace; and the loss of a child was attributed by physicians to malarious exhalations from the cellar. The trustees of this house were practical plumbers, and members of a public health association.

A handsome high-priced house was then purchased from a rich and reputable citizen, under whose personal supervision it had been built. The ground on which it stood was rather low; but a well-cemented foundation wall and cellar seemed to defy dampness, while a system of traps seemed to shut off unwholesome exhalations from waste water. After the first heavy fall of rain, however, the water from the well was unpleasant both to the palate and nostrils: the fault being attributed to surface drainage, the curbing of the well was raised a little. Finally, at the end of a very dry month, the taste and odor disappeared; and the last drop of water in the well disappeared soon after. Laughing at this feeble attempt of the Fates to torment them, the occupants drew upon their well-filled cistern: here they encountered odors and tastes more repulsive than they had found in the well. "Fresh cement always makes water taste bad," said a practical neighbor: so the cistern was promptly pumped dry, and washed out, and the neighbor aforesaid was rewarded for his suggestion by having his own well and cistern laid under contribution until the next rainfall. But somehow the faculty of that cement for spoiling water was remarkable; and we rejoiced when winter storms gave us a full well once more. For six months the cistern was undisturbed, except on washing-day, although the well occasionally yielded offensive water; at last, however, the well failed in the dry month of July, 1876. Once more the cistern was approached; the first strokes of the pump brought water that was as brown as coffee and as offensive as stable-drainage. Radical reform measures were immediately resolved upon, and a plumber engaged to apply them, with the following results: We learned that a cesspool which received all the kitchen drainage, including the water in which dirty clothing had been washed, was within two feet of the cistern, and eight feet of the well; the overflow-pipe of the cistern communicated with this pool, the dimensions of which pool were about two by five feet. The kitchen drainage of an ordinary washing-day could not with sufficient rapidity soak into the ground out of so small an enclosure: so it flowed into the cistern, while much that went into the ground found its way to the well. The gentleman under whose supervision this last-mentioned house was built was frequently asked about the location of the cesspool (for the well was dug after the house was purchased), and always indicated the whereabouts of a larger and quite remote pool, allowing the owner to sink a well in the immediate proximity to the smaller pool; the mason who had dug and laid the pool and cistern came once to clean and repair the latter, but never suggested the cause of the trouble. The damage done to the physiques of the several members of the family (some of whom are peculiarly delicate children) cannot easily be calculated, if, indeed, its full measure has yet appeared. The law — State, national, and moral — forbids that the builders of any of the three houses mentioned shall be slain by the persons injured, and it affords them many a chance of escape in case of suits for damages. But if the experiences recorded have befallen the lessee — a man with whom good ventilation, perfect drainage, and pure water are hobbies — in three short years, and in houses apparently excellent, what must be constantly happening to people who are careless on these points, and who consider a house attractive in proportion to the smallness of its rent? How many householders are there, who, untiring in their efforts for the good and comfort of their families, are being steadily and successfully fought by deadly enemies underground? How many thousands of the "sad and mysterious dispensations of Providence" may be traced to ignorant or unscrupulous builders and their employees?

This much the writer has learned by sad experience: to resolutely trace unpleasant house-odors to their source, to discover some cause for the evening lassitude which is common in many families, and to hurry to the physician for analysis a sample of any drinking-water which seems in any way objectionable. — *Christian Union.*

NOTES AND CLIPPINGS.

DRY DOCK. — Mr. J. E. Simpson has constructed for Messrs. Cramp & Sons, at Philadelphia, a dry dock, of which the dimensions are as follows: length from head to gate, when in position, 430 feet; length of keel blocks, 420 feet; width at bottom amidships, 45 feet; width at top amidships, 111 feet; width at gate, 70 feet; depth, 26 feet; depth below high tide, 23 feet. As the river at this point is fresh, there is nothing to be feared from the teredo, or ship-worm; and hence wood alone has been used. After making the necessary excavations, the foundation was formed by driving twelve-inch iron-shod oak piles about ten feet into the disintegrated gneiss rock which underlies that locality. These piles are placed about four feet apart in both directions, over the entire bottom, except along the centre under the keel blocks, where there are four touching each other in each row. To the top of the piles are fastened twelve-inch timbers running across the width; and on these is laid the floor of three-inch plank. To form the sloping sides, piles were driven vertically in rows corresponding to those in the bottom, and cut off to a line conforming to the proper inclination. On the top of the piles were secured timbers running longitudinally; and to these were framed and fastened other timbers running down the slope, and fastened at the foot to the bottom timbers. To these sloping timbers were fastened the planking of the sides, consisting of timbers, the cross-section of which is a right-angled triangle, with one of the acute angles cut away for a few inches, and so placed as to form steps of about eight inches rise and the same tread. Several rows of sheet-piling were driven across under the dock to prevent the water from the river finding its way underneath, and tending to float it. The gate is an iron boat of sufficient length and depth to fill the gateway. The keel, stem, and

stern post project evenly about six inches, and are made to fit in grooves in the bottom and sides of the gateway. These grooves are lined on their inner sides with rubber, so that when the pressure comes against the gate a water-tight joint is formed. The gate has tanks to be filled with water to sink it to its position, and is provided with pumps to exhaust them, and also valves to admit water to the dock when it is to be filled.

Christ Church Belfry, Oxford. — Few of his American readers know the author of "Alice in Wonderland" as a writer on art; and yet he is the reputed author of an anonymous work on architecture, a copy of the second thousand of which has found its way, after several years' wandering, to our desk. The special subject of the work is "The New Belfry of Christ Church, Oxford," of which the following picture is given: —

§ 1. On the etymological significance of the new belfry, Ch. Ch.

The word "belfry" is derived from the French *bel*, "beautiful, becoming, meet;" and from the German *frei*, "free, unfettered, secure, safe." Thus the word is strictly equivalent to "meat-safe," to which the new belfry bears a resemblance so perfect as almost to amount to coincidence.

§ 2. On the style of the new belfry, Ch. Ch.

The style is that which is usually known as "Early Debased;" very early, and remarkably debased.

. . . . . .

§ 7. On the impetus given to art in England by the new belfry, Ch. Ch.

The idea has spread far and wide, and is rapidly pervading all branches of manufacture. Already an enterprising maker of bonnet-boxes is advertising "the Belfry pattern;" two builders of bathing-machines at Ramsgate have followed his example; one of the great London houses is supplying "bar-soap" cut in the same striking and symmetrical form; and we are credibly informed that Borwick's Baking Powder and Thorley's Food for Cattle are now sold in no other shape. — *Exchange.*

The Rotunda of 1873. — Although only a few traces of the Exhibition of 1873 still remain in Vienna, the iron rotunda, one of the finest and boldest iron structures that have been made to this day, can still be seen. It was designed by Herr Schmidt, an engineer, who made all the calculations. Some of its dimensions are as follows: interior diameter, 339 feet; height to the springing of the trusses, 79 feet; total distance from the ground to the tip of the imperial crown, 274 feet. The great circular plate, measuring 339 feet across, which receives the trusses, was fitted together, and then raised to its place upon the top of the wall, although the huge ring weighed close upon four thousand tons.

A Safe Chandelier-Slide. — A new invention, which has just been patented by Thackara & Buck of Philadelphia, solves the problem of sliding lights without any of the cumbrous mechanism of hydraulic pulleys, chains, or weights; and so enables the whole of a chandelier to be made wonderfully light and aërial, as befits a substitute for the rosy fingers of Aurora. The principle of the discovery is marked by delightful simplicity. It consists of a cylindrical chamber, about two inches in height and an inch and a half in diameter, closed at top and bottom. Within this is placed a dual spring; a brass band slotted down the surface, rimmed at the top and turned at the base, being encircled by a coiled spring; the two contracting and expanding automatically. Within the band, and filling up the space which surrounds the sliding rod, passing through the chamber, are a number of perfectly rounded and smooth metallic marbles; and these, together with the double spring, effectually and firmly grip the sliding rod, which can be drawn down or pushed up with the fullest freedom and certainty, and without the possibility either of the rod slipping, or of the apparatus getting out of order. The improvement makes sliding chandeliers safe, and, by diminishing weight, adds greatly to the possibilities of beauty in form and design.

The Mausoleum of Augustus, or Corea Theatre. — A correspondent to the *New York Evening Post* says that this theatre is the ruin of the mausoleum which the great Augustus built to contain his funeral urn and those of all his relatives, connections, and dependents. In his day it consisted of a lofty marble tower, with three retiring stages, each of which had its terrace covered with earth and planted with cypresses. These stages were pierced with many chambers destined to receive the ashes of those who were buried there. It formerly rose from the midst of grassy meadows on the banks of the Tiber; but, although the river is still as near as it was then, the city is so thickly built up that its neighborhood is forgotten. The monument itself is not less changed than its surroundings. The dark chamber where once were placed the ashes of the great Cæsar is still shown, and there is a circular piece of marble where the funeral vase once stood. But the urn is now in one of the museums of the city, and the ashes, once so precious, have been scattered to the winds. The mausoleum is a ruin; but the old walls remain in their circular form, and the summit has been levelled off, and converted into summer theatre without a roof. There was some idea, a few years ago, of covering it with glass, and spending sixty thousand dollars to repair it.

The Ridgway Library Building in Philadelphia, built from a fund left for that purpose by the eccentric Mr. Rush, will be one of the costliest structures for the protection of books in the world. It will cost eight hundred thousand dollars.

Russian Houses in Winter. — The windows are invariably double; and the space between the sashes is covered with a layer of fine sand, intended to absorb moisture, and prevent the frost from silvering the panes. Twisted horns of paper containing salt are set in it; and sometimes the sand is concealed by a bed of moss. There are no outside shutters or blinds, for they would be useless, since the windows remain closed all the winter, being carefully filled in around the edges with a kind of cement.

Dr. Schliemann has transferred the scene of his labors from the Troad to Greece. He is now engaged in excavating the ruins of the Acropolis, and the Lion Gate of Mycenæ.

Curious Natural Cisterns. — In the rough granite country back from Mossamesdes, on the west coast of Africa, are some very remarkable natural cisterns. The country itself is peculiar, huge single rocks rising out of the nearly level plain in some places, and other hills of rocks, in several of which, deposits of water are found at the very top. A recent traveller visited one of these, and describes it as a natural tank with narrow entrance containing some three or four hundred gallons of exquisitely clear and cool water. It was covered by vast slabs of granite, from which the rain drained into it during the rainy season, shading the water so that it could not be seen without a torch, and so protecting it that the sun cannot evaporate it during the dry season. Thus a bountiful store of excellent water is preserved, while there is not a drop to be had elsewhere for miles. A still more remarkable cistern of this sort is that of the Pedra Grande, or Big Stone, some thirty miles from Mossamesdes, a huge rounded mass of granite rising out of a sandy plain. On the smooth side of this rock, twenty or thirty feet above the plain, is a circular pit about ten feet deep and six feet across. The rainfall on the rock above the pit drains into it, filling it completely every rainy season. The walls of the pit (which is shaped like a crucible, narrowing gently to the bottom) are perfectly smooth and regular, the enclosing granite being of the closest and hardest description. The cistern will hold several thousand gallons of water. Near by are smaller pits of similar character. Their formation is unexplained. The water of this strange well furnishes the natives and travellers with an abundant supply during the dry season, consequently it is a noted halting-place.

Ivy. — There is a popular belief that ivy growing upon a building renders it damp and unhealthy, which is quite unreasonable: in fact, if a wall, particularly a north wall, be damp, the best treatment is to plant English ivies at its base; for not only does the dense foliage of the plant keep out rain, but its aërial roots absorb the moisture already in the wall. The real mischief done by ivy is to old buildings of stone or brick, from whose joints the mortar has been dislodged. An ivy-shoot once lodged in one of these crevices will grow in bulk until in the course of years it has so pressed the joints apart that the masonry can be dislodged by any strong vibration of the building.

The Highest Steeple in New York. — The spire of the Fifth Avenue Presbyterian Church is finished, the cap-stone being in place at a height of two hundred and eighty-six feet, two feet higher than that of Trinity. Sixteen feet more of bronzed and gilded cresting, which the architect had included in his drawings, were rejected.

An accident at the mines of Falun, in Sweden, is described in a recent number of the *Engineering and Mining Journal*. An old copper mine which in the seventeenth century had already suffered from numerous "caves" has for the last few years been worked almost wholly from old "reserves," including the partial or complete robbing of pillars formerly left for safety. A prominent engineer had prophesied exactly the catastrophe which has come to pass; but his plans and advice were rejected, and the old method continued, "until, from a point more than one thousand feet below the surface, a tremendous collapse set in, the extent of which may be inferred from the circumstance that several acres on the surface sank about fifteen feet;" and it is not yet certain that the disturbance is over. The dropping of small fragments of rock for several weeks, and other signs of something unusual impending, may account for the wonderful escape of the workmen, who saved themselves through the shaft before it became choked, with the exception of one who had gone back to warn his comrades, and eventually found his way to another shaft, and climbed by the pump-rods to the upper air.

Statue of Seward. — The statue of Seward, by Randolph Rogers, has just been "unveiled" in Madison Square, New York. The statue, as is well known, originated in a conference between Mr. Richard Schell, George J. Forest, Lawrence Jerome, E. D. Morgan, Thurlow Weed, Hugh J. Hastings, and other gentlemen, by whom the required amount of twenty-five thousand dollars for the proposed memorial was promptly obtained. The casting was done at the Royal Bronze Foundery, at Munich. The statue was forwarded to Hamburg, and shipped to New York, arriving early last month. The statue represents Mr. Seward sitting with the right leg thrown over the left, and his body slightly turned to the left. In his left hand he holds a document, as if he had just been writing; and his right hand, in which he holds the pen, has fallen to his side. His cloak is thrown loosely over the back of the chair, and relieves the stiffness of the figure. Several books are placed under the chair, with a scroll on top. The height of the figure while sitting is ten feet. The base of the pedestal is composed of New England granite, and the upper part of variegated marble from Spezzia. On the face of the pedestal is the inscription: "William H. Seward, Governor, Senator, Secretary of State of U. S." The entire structure is about twenty feet high.

The Washington Monument. — The Board of United States Army Engineers detailed to examine the foundation of the Washington Monument is constituted of Col. Z. B. Tower, Lieut.-Col. H. G. Wright, Lieut. Q. A. Gillmore, and Lieut. R. I. Hoxie.